Current-carrying capacity PVC-insulated LV cables

according to HD 603 S1, part 3G and HD 627 S1, part 4H

The HD 603 and HD 627 are identical to DIN VDE 0276-603, resp. DIN VDE 0276-627.

Annotation

If reference is made to these tables for Bayka cables, they apply analogously and not only to the types specifically listed in the tables. (E.g. for products with insulation materials other than PVC, which have at least 70°C maximum conductor temperature, reference can be made to these tables.)

Notes on column selection are shown in [ ].

General

This section applies to the current-carrying capacity under both standard and deviating provisions provided that the cables are in three-phase operation with three conductors loaded or one single-core cable in d.c.-operation.

The rated current-carrying capacity are valid under standard provisions.

General Conditions

Temperatures °C (conductor)	
Maximum permissible operating temperature	+70
Maximum short-circuit temperature for cross sections area ≤ 300 mm^2	+160
Maximum short-circuit temperature for cross sections area > 300 mm^2	+140

Concentric conductors bonded at both ends.

Power frequency 50 Hz.

The tabulated rated current-carrying capacities are based on standard provisions such as:

- operating mode
- laying conditions
- environmental conditions

For deviating operating conditions the current-carrying capacities in the tables are to be multiplied by appropriate conversion factors which shall be based on the same calculation method and operating conditions as used for the current-carrying capacity given in this clause.

Current carrying capacity PVC-insulated LV cables

Laying in Erde (20°C)

Recommended values according to HD 603 S1, part 3G, table 14

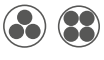
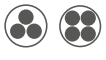
	NYY **NY2Y** [copper, without concentric conductor and braid]			**NYCY / NYC2Y** **NYCWY / NYCW2Y** [copper, with concentric conductor or braid]		**NAYY** **NAY2Y** [aluminium, without concentric conductor and braid]			**NAYCY / NAYCWY** **NAYC2Y / NAYCW2Y** [aluminium, with concentric conductor or braid]	
	 *)					 *)				
Number of loaded conductors	1	3	3	3	3	1	3	3	3	3
cross-section mm²	**copper conductor rated current in A**					**aluminium conductor rated current in A**				
1,5	41	27	30	27	31	–	–	–	–	–
2,5	55	36	39	36	40	–	–	–	–	–
4	71	47	50	47	51	–	–	–	–	–
6	60	59	62	59	63	–	–	–	–	–
10	124	79	83	79	84	–	–	–	–	–
16	160	102	107	102	108	–	–	–	–	–
25	208	133	138	133	139	160	102	106	103	108
35	250	159	164	160	166	193	123	127	123	129
50	296	188	195	190	196	230	144	151	145	153
70	365	232	238	234	238	283	179	185	180	187
95	438	280	286	280	281	340	215	222	216	223
120	501	318	325	319	315	389	245	253	246	252
150	563	359	365	357	347	436	275	284	276	280
185	639	406	413	402	385	496	313	322	313	314
240	746	473	479	463	432	578	364	375	362	358
300	848	535	541	518	473	656	419	425	415	397
400	957	613	614	579	521	756	484	487	474	441
500	1125	687	693	624	574	873	553	558	528	489
630	1304	–	777	–	636	1011	–	635	–	539
800	1507	–	859	–	–	1166	–	716	–	–
1000	1715	–	936	–	–	1332	–	796	–	–

*) Rated current for cables in d.c. systems with return conductor far away.

Current carrying capacity PVC-insulated LV cables

Laying in air (30°C)

Recommended values according to HD 603 S1, part 3G, table 15

	NYY **NY2Y** [copper, without concentric conductor and braid]			**NYCY / NYC2Y** **NYCWY / NYCW2Y** [copper, with concentric conductor or braid]		**NAYY** **NAY2Y** [aluminium, without concentric conductor and braid]			**NAYCY / NAYCWY** **NAYC2Y / NAYCW2Y** [aluminium, with concentric conductor or braid]	
	 *)					 *)				
Number of loaded conductors	**1**	**3**	**3**	**3**	**3**	**1**	**3**	**3**	**3**	**3**
cross-section mm²	**copper conductor rated current in A**					**aluminium conductor rated current in A**				
1,5	27	19,5	21	19,5	22	–	–	–	–	–
2,5	35	25	28	26	29	–	–	–	–	–
4	47	34	37	34	39	–	–	–	–	–
6	59	43	47	44	49	–	–	–	–	–
10	81	59	64	60	67	–	–	–	–	–
16	107	79	84	80	89	–	–	–	–	–
25	144	106	114	108	119	110	82	87	83	91
35	176	129	139	132	146	135	100	107	101	112
50	214	157	169	160	177	166	119	131	121	137
70	270	199	213	202	221	210	152	166	155	173
95	334	246	264	249	270	259	186	205	189	212
120	389	285	307	289	310	302	216	239	220	247
150	446	326	352	329	350	345	246	273	249	280
185	516	374	406	377	399	401	285	317	287	321
240	618	445	483	443	462	479	338	378	339	374
300	717	511	557	504	519	555	400	437	401	426
400	843	597	646	577	583	653	472	513	468	488
500	994	669	747	626	657	772	539	600	524	556
630	1180	–	858	–	744	915	–	701	–	628
800	1396	–	971	–	–	1080	–	809	–	–
1000	1620	–	1078	–	–	1258	–	916	–	–

*) Rated current for cables in d.c. systems with return conductor far away.

Current carrying capacity PVC-insulated LV cables

Permissible short-circuit temperatures and rated short-time current densities

Recommended values according to HD 603 S1, part 3G, table 17

Cables with	Admissible shortcircuit temperature in °C	Rated short-time current density in A/mm² for a rated short-circuit duration of 1 s					
		Conductor temperature at the beginning of short-circuit in °C					
		70	60	50	40	30	20
copper conductor							
≤300 mm²	160	115	122	129	136	143	150
>300 mm²	140	103	111	118	126	133	140
aluminium conductor							
≤300 mm²	160	76	81	85	90	95	99
>300 mm²	140	68	73	78	83	88	93

Current carrying capacity multicore cables

Group rating factors for multicore cables with different number of loaded conductors.

The following applies to three loaded conductors:

HD 603, part 3, main section G, section V (current carrying capacity) and section VI (appendix), table 14 and table 15 (carrying capacity, cables in earth / in air), both tables column 3 and column 5 for cables with PVC insulation

Group rating factors for multicore cables with different number of loaded conductors according to HD 627 S1, part 4H, table A.1

Number of loaded conductors	Laying in earth	Laying in air
5	0,70	0,75
7	0,60	0,65
10	0,50	0,55
14	0,45	0,50
19	0,40	0,45
24	0,35	0,40
40	0,30	0,35
61	0,25	0,30